

Docket No. F-8634

Ser. No. 10/574,041

REMARKS

Claims 1-19 and 22-25 are now pending in this application. Claims 20-21 are previously canceled. Claims 1, 3, 13, and 14 are withdrawn. Claims 2, 4-12, and 15-19 and 22-25 are rejected. No new claim is added. No claim is amended.

Applicants respectfully request reconsideration of the pending claims in light of the following remarks. Applicants respectfully submit that the application is in condition for allowance.

Subject Matter of the Claimed Invention

The subject matter of the claimed inventions is directed to a heat exchanger having first and second meandering pipe sections. Each of the first and second meandering pipe sections includes straight pipe sections. A connecting pipe section (also referred to as a connection pipe) connects the first and second meandering pipe sections. Of particular significance is that the connecting pipe section shape is one in which the pipe bends outward while also twisting about its circumference. Such shape can be seen from the embodiments shown in Figures 22 and 25. Note that the connecting pipe section does not just bend perpendicular to the meandering pipe section (i.e., outward) (as in the embodiments shown in Figures 1-4). The connecting pipe section also twists so as to be somewhat diagonal to the straight pipe section and the meandering pipe section from which it originates. To state

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this in different words consider each meandering pipe section as being in two spaced apart parallel xy planes and that each given straight pipe section occurs along the x axis. The connecting pipe section does not just take a shape bending in a z-axis direction while remaining at the same y-axis coordinate (with slight changes along the x-axis to smoothen the curvature) - as per the Figures 1-4 embodiment. Instead the connecting pipe section changes along both the z-axis and y-axis (with slight changes along x-axis to smoothen the curvature) - as per the Figures 22 and 25 embodiment. Or, in another embodiment encompassed by the claims, the curvature may change substantially along all three axes.

Section 103 Rejections and the Cited Art

Independent claims 2 and 25 are rejected under 35 USC §103(a) as being unpatentable over Marukasa Shigeo (JP 2001 199697). Independent claims 2 and 25 also are rejected under 35 USC §103(a) as being unpatentable over Tokyo Radiator Manufacturing (JP 63-190777) in view of Charlton (U.S. Patent No. 2,851,082). The Examiner combines the primary references with additional references to also reject the dependent claims. The rejections are respectfully traversed.

The Examiner acknowledges that the Tokyo Radiator Manufacturing reference does not disclose a connection pipe section extending outwardly and twisted to connect two meandering pipe sections. The Examiner indicates that both

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the Marukasa reference and the Charlton reference disclose such a connection pipe. Such finding is respectfully traversed. It is respectfully submitted that both references merely teach a connection pipe that is curved outward. Neither reference discloses that a connection pipe also may be twisted about its circumference. Similarly, none of the other cited art discloses a connection pipe that extends so as to change about three axes - outwardly to change along one coordinate axis (and along a second coordinate axis to smoothen the curvature) and twisting so as to change along yet another coordinate axis.

In the Examiner's response to Applicants' arguments, the Examiner treats the 'twisting' limitation as being related to the method of forming the heat exchanger. It is respectfully submitted, however, that such limitation is directed to the shape of the connection pipe (claim 2) and connecting pipe section (claim 25) indicating how the shape changes along the length of the connecting pipe section - as described above. Accordingly, the limitation is to be given patentable weight as to the shape of the connecting pipe section / connection pipe.

The Claims Distinguished

Claim 2 distinguishes over the cited art based at least upon the following claim limitations:

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- wherein the meandering pipe main body is so constructed that **the connection pipe** between the one and the other meandering sections at one of the straight pipe section sides **is curved outwardly while the connection pipe is twisted in the circumferential direction with regard to the axis directions of the straight pipe sections** to narrow the distance between the one and the other meandering sections, and wherein the straight pipe sections of the one and the other meandering sections are arranged in parallel to each other

It is respectfully submitted that the cited art does not disclose a connection pipe that is curved outwardly and twisted in the circumferential direction along its length with regard to the axis directions of the straight pipe sections. It is noted that such limitations indicate that the connection pipe shape changes along two axes distinct from the axis direction of the straight pipe sections. In particular, the cited art shows only a change relative to one axis that is distinct from an axis direction of a straight pipe section. At the least, the cited art does not disclose a twisting shape of the connection pipe.

Claims 4-12, and 15-24 ultimately depend from claim 2 and distinguish over the cited art based at least upon the same reasons as given for claim 2.

Claim 25 distinguishes over the cited art based at least upon the following claim limitations:

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- wherein the connecting pipe section curves outwardly and twists circumferentially along its length from the first meandering section to the second meandering section.

It is respectfully submitted that the cited art does not disclose a connecting pipe section shaped to both curve outwardly and twist circumferentially along its length. It is noted that such limitations indicate that the connecting pipe section shape changes along two axes distinct from the axis direction of the straight pipe sections. In particular, the cited art shows only a change relative to one axis that is distinct from an axis direction of a straight pipe section. At the least, the cited art does not disclose a twisting shape of the connecting pipe section.

Claims 5-11, 15-19, and 22-23 also ultimately depend from claim 25 and distinguish over the cited art based at least upon the same reasons as given for claim 25.


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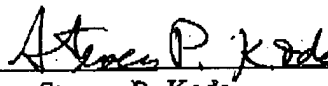
No fee is believed due. If there is any fee due the USPTO is hereby authorized to charge such fee to Deposit Account No. 10-1250.

In light of the foregoing, the application is now believed to be in proper form for allowance of all claims and notice to that effect is earnestly solicited.

Respectfully submitted,
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